NON-INVASIVE METHOD AND APPARATUS FOR CARDIAC PACEMAKER PACING PARAMETER OPTIMIZATION AND MONITORING OF CARDIAC DYSFUNCTION

ABSTRACT

Non-invasive method and apparatus for monitoring the condition of a heart failure patient and for optimizing the pacing parameters of a cardiac device implanted in a patient. A plethysmogram signal, e.g., a finger photoplethysmogram, is obtained from a patient and provided to a programmer device. The plethysmogram signal is analyzed by the programmer device to obtain a cardiac performance parameter, e.g., a pulse amplitude response, a degree of pulsus alternans, or irregularity in the pressure pulses detected in an atrial fibrillation patient. The effect on the cardiac performance parameter derived from the plethysmogram is determined for various pacing parameter values in a manner so as to reject noncardiogenic effects and artifacts. Pacing parameters resulting in the best cardiac performance parameter may be selected as the optimum pacing parameters. The programmer device may monitor a Valsalva maneuver performed by a patient. Optimum pacing parameters may be derived by analysis of the plethysmogram signals obtained during performance of the Valsalva maneuver using different pacing parameters.